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| 10/606,829 | 06/27/2003 | Xinhua Gu | A8583 | 4829 |

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EXAMINER

BOLDA, ERIC L

ART UNIT PAPER NUMBER

3663

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/606,829

Applicant(s)

GU ET AL.

Examiner

Eric Boldt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2005.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
 4a) Of the above claim(s) 4 and 17-34 is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-3 and 5-16 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
 10) ☒ The drawing(s) filed on 18 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____.
 4) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
 5) ☐ Notice of Informal Patent Application (PTO-152)
 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group IA, claims 1-3 and 5-16 in the reply filed on Aug. 18, 2005 is acknowledged. Claims 4 and 17-34 are withdrawn as being directed to non-elected invention.

Specification

2. The disclosure is objected to because of the following informalities: on p. 13, lines 4-5, the sentence "The optical device 30, such as a fiber grating (which is a mirror), coupled after the Faraday rotator 25 not is transmissive" makes no sense.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 10, 12, 13, and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "erbium/ytterbium" in claim 10 is indefinite, because it is unclear what the slash means ("and" or "or").

Claims 12 and 13 recite the limitation "the polarization beam splitter" in claim 5. There is insufficient antecedent basis for this limitation in the claims. The term "fiber axis" is conventionally taken to mean the axis along which light propagates, so it is unclear how it can match the (presumably polarization) orientation of the beamsplitter.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "fiber axis" in claims 12 and 13 is used by the claim to mean "polarization axis", while the accepted meaning is "optical propagation axis." The term is indefinite because the specification does not clearly redefine the term.

Furthermore, Claim 13 recites the limitation "the optical device is transmissive" in claim 5. There is insufficient antecedent basis for this limitation in the claims, since it does not specify which optical device is transmissive.

Yet further, it is unclear, whether the Faraday rotator mirror is placed at the first port of the polarization maintaining beam router, or not, since the optical device that may possibly be transmissive, has no antecedent.

With regard to claim 16, a broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by

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such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 16 recites the broad recitation "or other wavelength", and the claim also recites "approximately 1550 nanometers" which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Heritage (US Pat. No. 4,928,316).

With regard to claim 1, Heritage discloses in Fig. 1, an optical pulse shaping system comprising: a source of ultra-short pulses, such as a mode-locked laser (1), and a modulator (which functions as a pulse selector coupled to an output of the mode-locked laser (5). The pulse selector modulates an output stream of pulses based on an applied signal voltage from the signal generator (7).

With regard to claim 2, Heritage discloses in 6th col. lines 65-69 and 7th col. 1-8 that the pulse selector comprises an electro-optic modulator.

Claim Rejections - 35 USC § 103

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heritage as applied to. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heritage as applied to claim 1 above, and further in view of Pan (US Pat. No. 5,463,647). Heritage does not disclose that the electro-optic modulator is a LiNbO₃ modulator. However, Pan teaches (2nd col. lines 23-24) a LiNbO₃-based electro-optic modulator. It would have been obvious to one skilled in the art (e. g. an optical engineer) to use the LiNbO₃-based electro-optic modulator of Pan in the optical pulse system of Heritage for the purpose of reduced size.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heritage above, and further in view of Fermann (US Pat. No. 6,885,683). Heritage discloses in Fig. 1, an optical pulse shaping system comprising: a source of ultra-short pulses, such as a mode-locked laser (1), and a modulator (which functions as a pulse selector

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coupled to an output of the mode-locked laser (5). The pulse selector modulates an output stream of pulses based on an applied signal voltage from the signal generator (7). Heritage does not disclose a polarization maintaining device coupled to an output of the mode-locked laser, nor a pulse stretcher, nor an amplifier. However, Fermann teaches in Fig. 1 a pulse source (5), pulse stretcher (2) coupled to the pulse source via optical fiber, and an amplifier (3) coupled to the pulse stretcher, (and a pulse compressor coupled to a second output of the optical fiber). Note that all optical fiber is polarization maintaining (see 7th col. lines 7-8), hence the pulse source and pulse stretcher are connected by polarization maintaining device. It would have been obvious to one skilled in the art (e. g. an optical engineer) to place the modulator of Heritage between the second output of the polarization maintaining fiber and the pulse stretcher in the device of Fermann, for the purpose of selecting maximally amplified pulses.

With regard to claim 6, Fermann disclose in Fig. 12 a dispersion compensating fiber, and a Faraday rotator mirror.

With regard to claims 7, 12 and 13, non-polarization maintaining dispersion shifted fiber is well known in the art of optical engineering.

With regard to claim 8, Fermann disclose in Figs. 12 a pulse stretcher that comprises a linearly chirped fiber grating (47) and a Faraday rotator (49).

With regard to claim 9, Fermann disclose that the fiber grating is alternatively a nonlinear chirped fiber grating.

With regard to claim 10, Fermann disclose in Fig. 9 that the amplifier comprises a ytterbium doped fiber amplifier, a WDM, and a diode pump. An erbium doped fiber amplifier is well known in the art of optical engineering.

With regard to claim 14, Fermann discloses in Fig. 14 a second pulse selector coupled to an output of the first pulse selector.

With regard to claims 11 and 15, the pulse selector comprises an electro-optic modulator.

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fermann in view of Heritage. Fermann teaches in Fig. 1 a pulse source (5), pulse stretcher (2) coupled to the pulse source via optical fiber, and an amplifier (3) coupled to the pulse stretcher, (and a pulse compressor coupled to a second output of the optical fiber). Note that all optical fiber is polarization maintaining (see 7th col. lines 7-8), hence the pulse source and pulse stretcher are connected by a polarization maintaining device. Fermann also teaches in Fig. 15 an amplifier module to be used with the pulse stretcher, with a pulse selector (52b) (to be coupler to the first amplifier) and a second amplifier (56) coupled via a beamsplitter (58) to a second output of the polarization-maintaining fiber. Fermann does not teach that the pulse source is a mode-locked laser. However, Heritage teaches in Fig. 1, an optical pulse shaping system comprising: a source of ultra-short pulses, such as a mode-locked laser (1), and a modulator. It would have been obvious to one skilled in the art (e. g. an optical engineer) to use the mode-locked laser of Heritage in the optical pulse system of Fermann for the purpose of producing pulses periodically in time. Note that the phrase

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“operating at approximately 1550 nanometers” is part of the the preamble of the claim, and is given no patentable weight by the Examiner (see MPEP § 2111.02 and *Catalina Marketing International Inc. v. Coolsavings.com, Inc.* 62 USPQ2d 1781, 1785 (Fed. Cir. 2002)). In any case, the references as combined above are operable as a chirped pulse amplifier within a fiber optic system at a signal wavelength of 1550 nanometers, as is commonly used in the art of optical engineering. See for example Galvanauska et al. (US Pat. No. 5,847,863).

The clause “for a fiber optic system..” is essentially a method limitations or statements of intended or desired use. Thus, these claims as well as other statements of intended use do not serve to patentably distinguish the claimed structure over that of the reference. See In re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 512 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

See MPEP § 2114 which states:

A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2nd 1647

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.

Apparatus claims cover what a device is not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Stock et al. (US Pat. No. 5,862,287), Reed et al. (US Pat. No. 6,272,156), and Barty et al. (US Pat. No. 6,804,045).

12. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Eric Bolda whose telephone number is 571-272-8104. The examiner can normally be reached on M-F from 8:30am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Jack Keith, can be reached on 571-272-6878. Please note the fax phone number for the organization where this application or proceeding is assigned is 571-273-8300 *starting July 15, 2005* (the old fax number 703-872-9306 remains until then).

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ER

Eric Bolda

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SPE 3663